



The Pileup

Newsletter of the CDXA

Charlotte Hamfest is Approaching!!

March 8-9, 2003 are dates to set aside. Those dates mark the Charlotte Hamfest. It is a time for renewing old acquaintances, having QSL cards checked, attending forums, finding needed gear, and enjoying an evening meal with lots of camaraderie. With a high-energy start in his reign as President for 2003, Ted Goldthorpe has already lined up a great raffle prize, and worked with Bob Burton to line up a great restaurant for this year's dinner event. I can't tell you the raffle prize but, it's a good one. With a few other ideas we hope to create a "buzz" around the CDXA booth which will make your visit enjoyable.

W4VHF	Ted Goldthorpe	President
N4PQX	Bob Burton	Vice-Pres.
K4SQR	Jim Miller	Sec.-Treas.
K4MD	Joe Simpkins	Cluster Mgr.
W3GQ	Paul Sturpe	Assoc. Cluster Mgr.
WB4BXW	Wayne Setzer	Webmaster
K8YC	John Scott	Editor

The restaurant this year, Red Rocks, is new to CDXA, and it comes highly regarded. A hospitality hour will begin at 6:45 PM, and dinner will commence promptly at 7:30 PM. Please signify your dinner intentions to Bob Burton, N4PQX. Maps will be available at the hamfest. As a plus, Red Rocks is not too far from the hamfest site!

Among the forum speakers this year will be Riley Hollingsworth of the FCC's enforcement division, Bob Heil back with a new installment on the "science of audio", Dave Anderson speaking of his Chatham Island DXpedition experiences, Scott Robbins of Ten-Tec giving an introduction to the new Orion transceiver, and Wayne Mills providing comments on what's going on as regards member services at the ARRL.

Details of the hamfest are available at <http://www.w4bfb.org/hamfest.html> or by using a hotlink from the CDXA website. We hope to see all of you on March 8 and 9.

Have You Seen Our Website, Lately?

When Ted Goldthorpe took over the reins of CDXA, he had some definite ideas of what he wanted to accomplish. One of those ideas was to have a first class website which would serve the needs of the membership and which would attract visitors as a site worth bookmarking in their browsers. To that end, Ted called upon a friend of some 30 years, Wayne Setzer, to be our Webmaster. Wayne has a lot of experience in supporting websites, and the results to date have been very pleasing.

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CDXA PacketCluster & Other Communication Systems		
W4DXA (11 mi. NNE of Mooresville)	144.93 MHz (1200 bits/second)	441.00 MHz (9600 bits/second)
K4MD Charlotte, NC	144.91 MHz (1200 bits/second)	441.075 MHz (9600 bits/second)
Digipeater near Wingate, NC	144.91 MHz (DXWIN)	
CDXA Repeater 147.18 MHz (+600)	W4DXA, Near Fort Mill, SC	
World Wide Web Homepage	www.cdxa.org	
Wednesday Luncheon (11:30 AM)	Shoney's, 355 Woodlawn Road, Charlotte, NC (704-525-4395)	

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Wayne has given the CDXA website (URL: www.cdxa.org) a number of interesting links, updated our roster material, and provided an overall look that attracts attention. If you click on the world map on the homepage, you'll find it leads to the CQ WAZ zone map—a useful tool for those working on WAZ awards. Some useful links to sites of interest for DXers have been added. Your editor found a few new useful sites on the list, and with the hotlinks there's little reason to bookmark them in my browser. A callsign lookup has been added to the homepage to find a CDXA member.

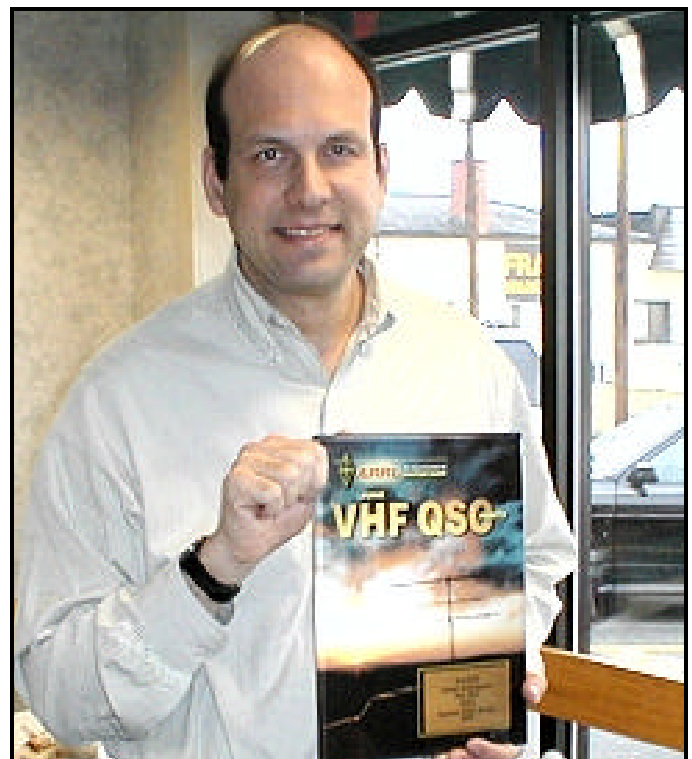
Three new useful features are 1) a hotlink to the CDXA reflector, 2) a “boneyard” to sell old gear, and 3) links from individual roster entries to the QRZ.COM entry related to that callsign. The hotlink to the reflector (more elsewhere on that in this issue) allows any member to send a broadcast email to those members who subscribe to the list. If you've got an antenna, ‘boat anchor’, or tower sections to sell, put the entry in the boneyard, and use the reflector to tell all members simply and easily that your prize possession is waiting for them to check out on the CDXA website. The links from the roster to QRZ.COM fulfill a longstanding desire of your editor to let the world know just who the members of CDXA are. I had always envisioned some sort of free-form page behind each person's roster entry where, by double clicking, one could learn of all the awards earned and interests held by any of our members. There has always been that capability on QRZ.COM, however. So, by linking the roster entry to QRZ.COM, each member can maintain his own “story” to the world on

QRZ.COM and link to it directly from the CDXA website. Now that we have a link, I encourage all CDXA members to add/edit their own biographical information on QRZ.COM, letting all know about your awards, years in “hamming”, and interests in the hobby.

I'm sure there are a number of additional good ideas for our website amongst our membership. If you have one, please communicate it to one of the officers. Who knows, your favorite web feature may well end up on our site!! And by all means, make a visit to our reconstructed website. It will be worth the trip!

VHF #1 Award Arrives at Last

Paul Trotter, AA4ZZ, arrived at the CDXA luncheon on January 29 with a grin on his face from ear to ear. Back in June, 2001 the mountaintopping crew working as AA4ZZ took first place nationally in the Limited Multioperator classification of that year's ARRL VHF contest. Through a series of events, including the sponsor's desire to migrate to a newly designed trophy—requiring concurrence of a number of parties to reach a design consensus—the time until the trophy showed up just lengthened and lengthened. As seen in the photo below, the wait for this handsome trophy was worthwhile. Way to go guys! Good luck in 2003!



The Pileup

Official Newsletter of the Carolina DX Association
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Published monthly 10 times per year, excluding the months of June and December.

The purpose of the association is to secure for the members the pleasures and benefits of the association of persons having a common interest in Amateur Radio.

Members of the CDXA shall adhere to “The Amateur's Code” as published from time to time in *The ARRL Handbook for Radio Amateurs*, and shall consist of those valid licensed amateur operators having an interest in promoting amateur radio. Long distance communications (DX) is of special interest to members of the association, but said interest is not a requirement of membership.

Dues are \$30 per year for those using the PacketCluster maintained by the Association, \$15 otherwise, payable each January. Dues are payable by check to the Secretary/Treasurer:

Jim Miller, K4SQR
11600 Hilda Court
Charlotte, NC 28226

Using H Double-Bay Antennas For Contest Diversity—Part 2

by Ron Bailey, AA4S

In January's "Pileup" I outlined my rationale for using H Double-Bay antennas to complement my yagis on 10, 15, and 20 meters during last November's CQ World-wide CW DX Contest. I also described my results and stated how pleasantly surprised I was at their performance. As promised, I spent some time using EZNEC to analyze my situation and will now attempt to pass on what I have learned although I admit I am just now getting familiar with this type of software. My thanks to Paul (W3GQ) and John (K8YC) for helping get me up to speed!

The first part of my study dealt with the following antennas: (Major elevation lobes are indicated in degrees.)

10 meters - (28.050 MHz.)

5 element N6ND re-design of a Hy-Gain 105BA at
62 feet - 8°, 24°, 43°

H Double-Bay wire antenna with top wire at 46 feet
- 14°

15 meters - (21.050 MHz.)

4 element W2PV re-design of a Hy-Gain 155BA at
60 feet - 11°, 34°

H Double-Bay wire antenna with top wire at 73 feet
- 11° and 35°

20 meters - (14.050 MHz.)

5 element Hy-Gain 205CA at 87 feet - 11°, 35°

H Double-Bay wire antenna with top wire at 72 feet
- 18°

After spending several fun hours generating and analyzing data, I realized it would be difficult to present them in a succinct and meaningful way without using a dazzling array of charts and diagrams. Rather, I have tried to describe my findings as clearly as I can within the available space.

Basically, I found that if the listed antennas are compared head to head, the yagis win by roughly 4 to 8 dB even at the favored takeoff angles of the H D-Bs. Not surprisingly, I had already discovered that while comparing them against each other using the international beacon system last month! One exception was a 3 dB advantage for the 10 meter Double-Bay (at 14°) over my 10 meter yagi, but this coincides with a yagi pattern null.

Worth mentioning at this time is that I am fortunate to have well-designed monoband beams at reasonable heights on separate towers. At a more modest station these wire antennas might hold their own against existing antennas. Or, in cases where erecting a tower is not practical, an H Double-Bay may offer a possibility.

Remember, my reason for installing these wire antennas was not to compete against the yagis but rather to complement them. If, for example, the beams are pointed toward Europe and the bi-directional wires are broadside to western Canada/Japan and the Caribbean, the flip of a switch probably results in a 20 to 30 dB difference between the two.

The second part of my study was to see if my decision to hang H Double-Bay antennas instead of dipoles had merit. Table 1, below, shows the predicted advantage in

Table 1 - Advantage (db) of H Double-Bay over dipole, same height top member					
<u>10m</u>		<u>15m</u>		<u>20m</u>	
8°	2.09	9°	2.65	11°	0.73
11°	2.90	11°	3.61	14°	1.40
14°	4.26	28°	-7.55	18°	2.86
24°	10.82	35°	3.87	35°	0.42

db at various radiation angles for the H Double-Bay antennas compared against dipoles at the same height as the top wires of the H D-Bs. (Major H D-B lobes are indicated in bold type.)

The data show that the 10 and 15 meter Double-Bays have a modest advantage over dipoles at their favored angles. But on 20 meters a dipole probably would work nearly as well overall! At this point my curiosity dictated further investigation.

One of the more useful and interesting features of the software is that it allows you to study how various heights above ground affect an antenna's pattern. For example, I found that if the middle of an H Double-Bay antenna is placed at the same height as a yagi, its zero

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azimuth pattern becomes very similar to that of the yagi but, of course, exhibits 3 to 4 dB less gain due to its bi-directionality. So in Table 2, below, we see how the H D-Bs perform with respect to dipoles if their middle

Table 2 -Advantage (db) of H Double-Bay over dipole—H D-B middle at yagi height, dipoles at top wire height					
<u>10m</u>		<u>15m</u>		<u>20m</u>	
8°	3.91	8°	2.65	11°	3.71
20°	-2.26	11°	4.16	14°	6.43
24°	4.18	26°	-6.70	27°	-6.75
35°	-14.54	34°	7.97	34°	6.17
43°	8.79	48°	-13.28	50°	-14.39

wires were raised to the same height as my yagis (62, 60, 87 feet, respectively). This places the top wires of the dipoles and H Double-Bays at 75, 77, and 113 feet. (Again, bold entries indicate H Double-Bay major lobe takeoff angles.) Now the theoretical gain versus dipoles at 75, 77, and 113 feet becomes more pronounced at favored H D-B angles but suffers at angles favoring the dipoles. This just proves an antenna cannot be all things to all people (or all radiation angles) and that there is no such thing as having too many antennas, hi!

This study was to evaluate my specific situation. For that reason I did not do comparisons against dipoles hung at the heights of the Double-Bay midpoints. If I were going to use dipoles I would have hung them at the same heights as the tops of the H D-Bs. Obviously, everyone's circumstances will be different.

In conclusion, I still feel my efforts were nicely rewarded for the amount of time and money expended. I can see using the EZNEC software in the future to adjust these antenna heights and orientations to optimize them for domestic contests such as the Sweepstakes and NAQPs. Anyone who either needs construction details or wants to be "dazzled by an array of charts and diagrams" call me at (704) 487-0337. I will be glad to share my information or even analyze your particular situation. I can also be reached on the CDXA repeater at 147.18 MHz. —Very 73, Ron, AA4S.

CDXAers in the News

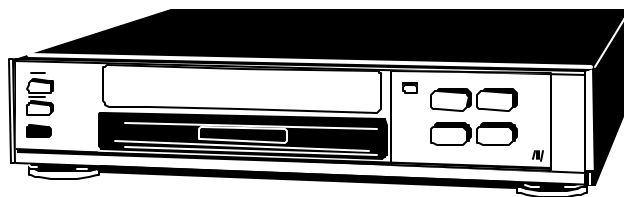
By John Scott, K8YC

When I received the SERA Repeater Journal for November 2002 through January 2003, I did not expect to see an item with a byline by a CDXA member. You may recall the winner of the 2002 CDXA Hamfest contest, awarding a copy of the book DXing 101, was Mary Holtschneider, KG4OGA. Mary was a relatively new Amateur Radio Operator back then and chose to visit the Charlotte Hamfest to see all the goodies.

Well, Mary has been busy with learning about DXing using the informative book she won, but she has also has an interest in emergency communication procedures as well as the traffic handling that goes along with emergency procedures. In her article entitled "ARRL Classes Go Beyond the License Test", Mary gives fine insight into the new emergency training classes now made available through the ARRL, partly through a grant from the Homeland Security Office of the Federal Government. Mary explains the three part training program in a concise article. To complement that training, she also engaged in some training in NTS traffic handling. Each of you will find her article interesting. Perhaps, Mary will return to the Charlotte Hamfest again this year—she lives near Raleigh—so you can chat with her about her experiences. I'm sure she'll bring a few DXer questions if she comes. Hope to see you, Mary!

DUES are DUE!

A play on words, you say? If I got you to read this far, it worked. Yeah, I know, you just didn't have the spare cash after the holidays to remit. Well, ladies and gents, dues ARE due in January (or earlier) each year, but as usual, we still have some unpaid members in early February. So, please remit ASAP. If you simply feel you must wait till the hamfest to pay, then payment will only be accepted by check for obvious reasons. As for April's Pileup, only members in good standing at that time will receive the newsletter. —The Editor



Grayline—Black Magic or What?

By John Scott, K8YC

Long before I started chasing DX, I was aware of the magic of grayline. But, I never heard a good explanation of just why it worked. Advice was that it works best if both stations are in or near grayline. "Always work the grayline by directing your signals into darkness," was the mandate. Advice, but few definitive answers.

There's an old adage about engineers that says, "Ask an engineer what time it is, and he'll tell you how to build a watch." So it stands to reason that for this engineer, it was not enough to know merely that grayline worked, but HOW did it work. I finally ran across a plausible explanation as I was thumbing through a book by Les Moxon, G6XN, entitled HF Antennas For All Locations published by the Radio Society of Great Britain.

First let me say that, Les recognizes that "official" propagation models over long paths have radio signals making multiple hops to the ionosphere, to earth, to ionosphere, and so on until the destination is reached. Yet, the traditional losses experienced when a radio wave encounters the earth suggest multihops from earth to ionosphere and back as improbable for long path lengths. As early as 1953, H. J. Albrecht suggested instead that "chordal hops" were a more plausible explanation for the propagation phenomenon noted by radio amateurs using the grayline.

The diagram below, taken from Moxon's book, hypothesizes how grayline propagation actually works. At the grayline transition, makeup of the F-layer consists of (1) a gradual increase of F-layer elevation as one moves

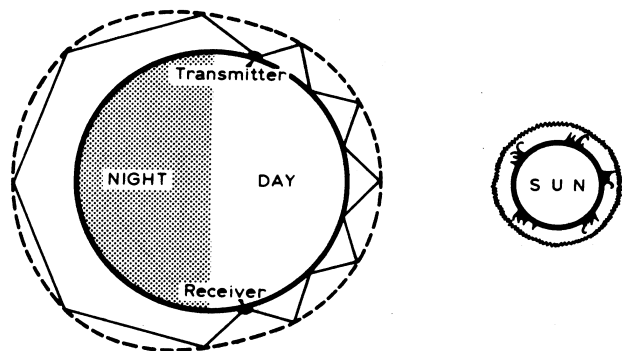


Fig 2.11. Showing how the change of effective layer height around dusk and dawn produces the layer tilts required for chordal-hop propagation between near-antipodal points, thus providing a night-time path with little absorption and the avoidance of ground-reflection losses

toward darkness, and (2) reformation of the F_1 and F_2 layers into a single, less dense layer of ionization. Wavefronts passing into the F-layer moving toward darkness encounter this rising F layer and are not refracted enough to return to Earth but rather are refracted in such a way as to hit the ionosphere at a shallow angle of incidence. Such waves experience repeated "chordal hops" with resultant low path loss until the reverse F-layer transition is encountered at the terminating grayline zone. There, encountering more a more dense F-layer as sunlight is approached, refraction is greater, and the wave is refracted more steeply to return to earth.

Is this right? Scientific method calls for observation, development of hypotheses to explain the observation, and evaluation of facts to see if they support the hypotheses. For this observer, the facts seem to support the hypothesis of "chordal hops" far better than they do the "multi-hop" theory. What do you think?

(Moxon's book, HF Antennas for All Locations, is available from the ARRL book list. ©1993, Second Edition, ISBN 1 872309 15 1—The Editor)

Our Thoughts are with you, Bob

By John Scott, K8YC

On January 14, 2003 I received a note from Bob Southworth, KI4YV, which saddened me. Late last year, Bob had an Implantable Cardioverter Defibrillator (ICD) installed in his chest. This is one of those wondrous "smart" electronic devices which can be implanted to regulate the heart beat when the human body can no longer do it successfully without help.

Bob is feeling better, I'm told, but the downside is that any time he gets near sources with high electromagnetic fields, it causes his ICD to "go nuts" and to try to "correct" for what it thinks is bodily-created electromagnetic disturbances. This requires Bob to stay away from arc welders, open automobile engine compartments, heavy induction electrical machinery, and yes, HAM RADIO.

Bob relates, "Well all of this boils down to, I am off the air from now on. It is a hard pill to swallow, but long ago I found the world is not fair, and I have survived—and I will this also. I have enjoyed Ham Radio for

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nearly 66 years, and I will miss it. Thank you all for your concern. It did not come as a complete surprise, since the few times I visited Discovery Place and they were transmitting, I felt it! Thought you guys should know what is going on."

Bob was the station manager at Discovery Place for over 10 years, and has been a traffic handler on the National Traffic System for many more than that. We may not hear your "fist" anymore, Bob, but we know your signals are still propagating out there somewhere. -73

Tower Talk

An email from Don Daso on February 4 reads, "Ever wonder about those three 'odd' towers along the Interstate in Charlotte? By now, you of course know they are WBT's radio towers. But have you ever thought or wondered about their design—they differ substantially from the typical ham radio norm. Here's a WWW link to some interesting facts and photos regarding this style of construction. (Indeed, the whole Tower-Pro website is worth perusing!)"

The link Don sent was:

<http://www.tower-pro.net/Articles/BK/wsm.htm>

The referenced article, even mentions the WBT towers Don refers to in his email.

Limited "Logbook of the World" Testing is a Hit

(The ARRL Letter, Vol. 22, No. 4 published by the American Radio Relay League and dated January 24, 2003 had the following good news for DXers.)

The long-anticipated "Logbook of the World" (LoTW)--the ARRL's secure electronic contact-confirmation system--took a major leap toward public release this month with several weeks of limited—or "alpha"—testing. Dozens of Amateur Radio operators checked out a preliminary version of the LoTW software, which is still under development. Once it's ready, LoTW will provide a means for participants to qualify for awards such as DXCC or WAS without having to first collect hard-copy QSL cards.

"This is cool!" exclaimed one alpha tester. "Slick!" declared another tester. "It's pretty neat so far. This looks like a good start."

ARRL staffer Dave Patton, NT1N, said the limited test run was extremely helpful. "One of the main things that will come out of this phase of testing is a good package that will be ready to give to logging program developers to incorporate into their software," he said.

ARRL Web and Software Development Manager Jon Bloom, KE3Z, explained that the League hopes that logging software vendors will choose to add value to their products by integrating LoTW client-side functions. "But the software we provide to individual amateurs will be sufficient for basic use of LoTW," he added. ARRL will not be releasing the LoTW server code, however.

Linked via e-mail, the LoTW testers spent two weeks registering their call signs, uploading logs and attempting to push the system to extremes. One tester was amazed at its robust nature after he uploaded a complete station log of about 320,000 QSOs. "I sent this blob expecting it to croak the server, but it didn't!" he said.

Logbook of the World Project Leader Wayne Mills, N7NG, says LoTW won't spell the end of QSL cards. Instead, he says, it will provide an avenue for increased speed and accuracy for hams chasing awards, as well as remove some chances for human error that can occur in the traditional process.

"This is really a system to offer credits for awards," said Mills, who is also ARRL's Membership Services manager. Mills said LoTW will minimize opportunities to "game the system" or otherwise cheat—something that's not always possible to detect even with paper QSLs. He emphasized that the League has no plans to do away with accepting traditional QSL cards as it's been doing all along. "We're not replacing the whole paper QSL scheme with Logbook of the World," he said.

Unlike electronic QSLing systems now in use, LoTW is not set up to exchange QSL "cards" via the Internet. The main idea is that ARRL will maintain a secure log database that will be constantly updated by DXers, contesters, DXpeditions and thousands of individual amateurs. Registering and uploading electronic logs cost nothing; the only time a user will incur a charge is when applying accumulated contact credits toward an award.

LoTW beta testing for the general Amateur Radio public is expected to begin soon. The ARRL has not announced a specific inauguration date for Logbook of the World.

Roving Reporter Visits K4DXA

After reading Ken Boyd, K4DXA, had climbed his way to DXCC Honor Roll status in the January 2003 Pileup, the Roving Reporter decided it was time to run down to Mint Hill to see Ken and find out how he got involved in amateur radio.

Roving Reporter: Here we are in early 2003, Ken, and now you're on the Honor Roll. When did you start the chase towards DXCC Honor Roll?

K4DXA: I can't really say it started as a chase towards the Honor Roll, but along the way, that became a goal. I was first licensed in 1973 as WN4DQJ. I started somewhat slowly, gaining experience, and in May 1975 upgraded to Advanced Class as WA4UNZ. About two months after becoming an Advanced operator, I got "bit" by the DXing bug. I soon put up my first tower and started contesting and DXing. By 1978 I had earned DXCC. Then the next logical step was to shoot for the Honor Roll. So, I guess it was a 27 year quest!

RR: Which entities put you over the top?

K4DXA: South Georgia and Ducie Island arrived almost at the same time. Since then, North Korea (P5) and Somalia (T5) have been confirmed. It's funny how you wait and wait and then the new ones come in the mail in clusters. Actually, I had worked the T5 in 1988 and recently found out who had the logs, so I sent for a QSL and finally got it. Now I sit at 328 active confirmed, and 336 overall, including deleted entities. Making the Honor Roll is the most exciting thing you can imagine for an avid DXer.

RR: What kind of gear have you used in your "quest"?

K4DXA: I started with a HW-16 Heathkit as a novice but moved up to a HW101 when I upgraded to Advanced. Along the way I've had a Kenwood TS-520S, TS-180, TS-430, Ten-Tec Paragon, Icom 737 and a Yaesu FT-1000MP, but I've clearly enjoyed the Yaesu the most. My first tower was in Charlotte, but I then moved to Indian Land, SC about 5 miles east of Fort Mill where I eventually had two towers which Hurricane Hugo whisked away. Two moves later finds me in Mint Hill with a Bencher Skyhawk. Yet, I worked many of my new ones in the final stages of attaining Honor Roll status with a Butternut vertical right here in Mint Hill.

RR: Besides chasing DX and contesting, I understand

you've been active in other aspects of the hobby.

K4DXA: I've had a continuing interest in Skywarn and ARES. I guess using VHF in Skywarn spurred me toward enjoying 6m work, and I now have worked 210 six-meter grids with 50 confirmed. In the early 1980's I served as a Vice President of the Mecklenburg Amateur Radio Society, and later in 1987-89 served as President of the Carolina DX Association.

RR: You probably know a lot of amateurs in these parts, then?

K4DXA: Yes, and the friendships and experiences I've enjoyed because of them is one of the best aspects of the hobby. Ted Goldthorpe (W4VHF), Gary Dixon (K4MQG), Rick Porter (AA4SC) and I went on a mini-DXpedition to Saint Martin in 1989. Best part was being on the other end of the pileup and taking a lot of heat from the guys in our clubs about my operating style. A bunch of us went to the Bahamas in 1990 for a VHF contest—again being with radio buddies was great. Many folks think we in this "radio business" are nuts, and maybe we are, but I love the hobby and all the great folks I have met and befriended.

RR: Thanks, Ken, for sharing your story and congratulations again on making the Honor Roll.

Tips on Using the CDXA Mail Reflector

A mail reflector is a list maintained on a mail server which allows one to broadcast simple text messages to those who have "subscribed" to the list. All one needs to do is to prepare a message and send it to:

cdxa@mailman.qth.net

Posted messages are automatically stripped of any attachments or HTML content and delivered to the subscribers.

To subscribe, go to: <http://mailman.qth.net/mailman/listinfo/cdxa>. (Please note that Joe, AA4NN, is the list administrator and may already have subscribed you, but you would have been notified to accept or reject. If unsure, check at the above address.)

When subscribing, use the address of your **originating** mail system. If you've subscribed using a reflector for receiving mail, posts to the CDXA reflector will be delayed until Joe can validate your message since your subscribed address differs from your posting address.

The Back Page

Don't forget we want to see you at the **Charlotte Hamfest**. Details are on page one. Some great forums are on tap. Dinner will be at Red Rocks Cafe, Bar, and Bakery starting with hospitality at 6:45 PM. **RED ROCKS** is at 4223 Providence Road, one block north of Fairview Road near the corner of Providence and Old Sardis Road. If you get lost, call (704) 364-0402.

The **CDXA Website** has a great new look. Our new webmaster, Wayne Setzer, has added a number of new features and changed its overall look and utility. Details in an article on page one of this issue.

There's still plenty of contesting left before we're back to the summer doldrums. Below are some of the contests coming up in February, early March and beyond:

<u>Date(s)</u>	<u>Contest</u>	<u>Comments</u>
Feb. 15-16	ARRL Intl DX - CW	See Dec. 2002 QST, Page 95
Feb. 21-23	CQ WW 160m SSB	Jan. QST or www.cq-amateur-radio.com
Feb. 22-23	North Carolina QSO Party	February 2003 QST Page 104, or www.w4nc.com (Good job Henry and Forsythe ARC crew!)
Mar. 1-2	ARRL Intl DX - Phone	See Dec. 2002 QST, Page 95
Mar. 8	CDXA Chow-Down	Evening after Charlotte Hamfest @ Red Rocks
Mar. 15-16	Russian DX Contest	
March 29-30	CQ WW WPX - Phone	December, 2002 CQ, Page 36
May 24-25	CQ WW WPX - CW	December, 2002 CQ, Page 36

Jim Miller, K4SQR
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Charlotte, NC 28226

k4sqr@juno.com

First Class Mail

See something wrong with your address label? Notify K4SQR at once, please.